Responding to Activist Short Sellers:
Allegations, Firm Disclosure Choices, and Outcomes

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ABSTRACT

Activist short sellers identify and publicize allegations of overvaluation, and frequently fraud, to induce long shareholders to sell and thereby to profit from the resulting price decline. We provide descriptive evidence that firms make several distinct types of disclosures in response to activist short seller campaigns and are more likely to respond publicly to ex ante more credible reports. Firms that announce internal investigations launched by the board are significantly more likely to be delisted, face enforcement action, and are less likely to become an acquisition target. Our analysis provides important new evidence on the role of activist short selling and the information revealed in target firm responses.

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1. Introduction

Suppose you are the CEO or a director of a firm for which a prominent short seller has just released a report alleging accounting deficiencies, product issues, management incompetence, and overvaluation to such an extent that they claim your firm is a fraud. Your stock dropped more than 10 percent on the report's release and analysts and shareholders are looking for reassurance that the short seller's allegations are false. How should you respond? The answer depends on the credibility and severity of the allegations made by the short seller, as well as on the information you possess. If you are certain the allegations are false, you might issue a press release denying the allegations. Or you may decide to remain silent to avoid giving the short seller additional publicity. If you are a director and suspect that some the allegations are credible, the board can publicly announce the launch of an internal investigation to establish the truth and minimize its liability.

In this study we describe the types of response firms make when they are attacked by activist short sellers, and we examine the conditions associated with choosing among these responses. We then explore the associations between allegations, firm responses, and outcomes, which proxy for the underlying state of the firm. This is an important topic because activist short-seller campaigns have grown significantly both in number and media attention in recent years, and the evolving literature indicates that these market participants are effective in accelerating price discovery, improving market efficiency especially in cases where limits to arbitrage are significant (Ljungqvist and Qian, 2016). In addition to firm responses, we investigate outcomes and show significant effects impacts of the activist reports on: significantly higher rates of stock exchange delisting, enforcement actions, acquisitions, class action lawsuits, accounting restatements, director and officer turnover, and auditor resignations.

Activist short sellers publish research reports describing target firm overvaluation, in order to profit from the resulting price declines by having taken a short position in the target, via physical short selling, purchases of put options, or engaging in swap transactions in advance of the report's publication. The term *activist* relates to the active nature of the publication and promotion of their research, which aims to correct overvaluation by inducing long holders to sell. Activist short selling also frequently involves calling for change in management and alerting auditors, regulators, and prosecutors to further investigate their allegations.

We provide descriptive evidence on firm disclosure choices in response to activist short sellers to provide new insights into the phenomena of activist short sellers beginning with a comprehensive sample of potentially credible short seller reports described in Ljungqvist and Qian (2016). We expand this sample by collecting short seller reports over a longer period and by collecting our own sample of firm responses. Our sample covers 25 short sellers from 1996 through 2018 and consists of 351 reports on US-listed companies for which we have both the returns data and financial statement data needed to calculate our control variables. These short sellers are either individuals or small boutique investment partnerships who publish their research. Consistent with Ljungqvist and Qian (2016) we find significant negative returns to the report disclosure event (-7 percent from event day -1 to +1), and a further negative return of -30 percent in the year following report issuance. The last 20 years have seen dramatic growth in high-profile activist short seller campaigns, an average of 2.5 reports per year over the period from 1996 to 2009, increasing to an average of 35 reports per year from 2010 to 2018.

One of our first tests is to examine the types of firms targeted by activist short sellers, both because this is an interesting research question, and also so we can control for factors associated both with the likelihood of being targeted and that may affect disclosure and outcome choices in our later tests. We find that activist short sellers target firms with traditional indications of overvaluation and fraud risk. Firms are more likely to be targeted if they have lower book-to-market ratios, higher Tobin's Q ratios, are less profitable, and are predicted manipulators based on financial ratios according to Beniesh's (1999) M-score. Targeted firms are also likely to be recent IPO firms, where the incentive for manipulation is high, and foreign firms, where the potential for enforcement penalties are lower.

While prior research has examined the impact of activist short sellers on stock returns and shareholder turnover (Ljungqvist and Qian, 2016), we are the first to examine the firm disclosures in response to activist short seller campaigns. Activist short sellers make serious allegations about firms to support their opinion that the shares are overvalued. How management responds should help investors determine the extent to which the allegations are true, and it has potentially significant implications for the firm's share price, ability to access the capital markets, management's ongoing employment, and even enforcement responses. Understanding firm disclosure responses to activist short seller campaigns is therefore an important subject for further study.

We observe significant investor and media attention to activist reports, with abnormal media mentions spiking to 262 percent above normal. The significant average stock price decline following the issuance of these reports creates not only intense demand for a firm to respond, but also large risks and rewards to the firm as a result of making a public disclosure.

Controlling for the probability of being targeted, the disclosure choice is primarily related to the ex-ante credibility of the short sellers' report: if it alleges fraud, or if it provides new evidence not already available in public filings. When managers choose to respond, we find that these responses follow several stylized themes: denials of the allegations, hostile attacks on the short sellers' credibility, constructive responses that provide additional information, and the announcement of internal investigations to determine if the allegations have merit. A public response to these activist short sellers is not made in most cases, as we find that managers only make a public disclosure for 32 percent of the short seller campaigns in our sample. If one considers an insider purchase or sale as a more subtle disclosure option, the rate of response increases to 57 percent. We find that when firms do respond, the vast majority of disclosures take the form of press releases, as opposed to securities filings (8-Ks), which expose management to restatement risk, or conference calls, which expose management to potentially unwanted questions from investors.

Our predictions on the nature of the response, and what the response indicates about the true state of the firm is more intuitive as it relates to the type of signal sent by different disclosure choices (e.g., Skinner 1994). The default response is a simple denial of the short seller's allegations. Denials could be both truthful and false, but we expect that given the amount of investor and regulatory scrutiny, denials will be on balance associated with better firm outcomes.

The credibility and motives of short sellers has long been called into question. Even though we confirm in our sample the Ljungqvist and Qian (2016) result that activist reports on average cause significant price declines, and more credible reports, proxied by those presenting new information, have a greater impact, it is possible that these reports draw erroneous conclusions. There are numerous examples of enforcement actions against short sellers publishing untrue allegations.[1] Illegal market manipulation occurs when a short-seller takes a short position in advance of distributing false or misleading information, with the intention of driving down the

[1] "*The Commission will vigorously investigate and prosecute those who manipulate markets with this witch's brew of damaging rumors and short sales," said SEC Chairman Christopher Cox*. SEC Charges Wall Street Short seller with Spreading False Rumors (April 24, 2008), available at https://www.sec.gov/news/press/2008/2008-64.htm

stock price and covering the short position at a profit. The SEC cites manipulators as a motivation for proposing short-position disclosure regulations, noting that short selling bear raids were thought by some to have caused the 1929 market crash and the subsequent inability of the market to recover.[2]

We find that hostile disclosure responses to short sellers, i.e., responses that attack the short seller's credibility, are associated with a lower likelihood of delisting, indicating that such attacks on the short sellers credibility may reflect situations where companies are able to benefit by illustrating to the market that the short seller is not to be trusted.

Other strategic responses, such as suing the short seller for defamation, may aim to resolve market uncertainty in favor of the company by demonstrating the company's conviction that its propriety can be upheld in court. But lawsuits are not necessarily strong evidence of being wrongfully accused by the short seller.[3] Some target companies sue the short seller for defamation even when the allegations are true, with the primary intention being to silence a critic who lacks sufficient resources to mount a defense, rather than by establishing the merits of the particular case.[4]

The strategy is potentially risky. To successfully sue for defamation in a civil action, the target must prove several joint conditions: that the short seller published a false statement about the target, which harmed the reputation of the target or the target's executives. The primary defense to such a suit is for the short seller to show that the allegations are substantially true, and not every

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[2] Proposed Rule: Short Sales, Exch. Act Release No. 34-48709, 68 Fed. Reg. 62,972 (Nov. 6, 2005), available at https://www.sec.gov/rules/proposed/34-48709.htm.

[3] Lamont (2012) examines a sample consisting of firms who sue short sellers and take other technical actions to create short sale constraints, but does not consider the decision to sue or study the actions of activist short sellers.

[4] For example, Muddy Waters was sued by Sino Forest for defamation, although Muddy Waters prevailed in the case and regulatory investigations found that the firm had engaged in extensive fraud. Sino-Forest Corporation (Re), 2018 ONSEC 37. Available at: https://www.osc.gov.on.ca/en/Proceedings_rad_20180709_sino-forest-2.htm

allegation has to be completely accurate to present a successful defense. If proceeding to trial, the short seller is granted discovery rights to gather supporting information from within the firm. Some jurisdictions have attempted to reduce the cost of defending defamation suits to protect critical speech that serves the public interest. Anti-SLAPP legislation ("strategic lawsuit against public participation") aims to reduce the costs of defending defamation lawsuits when the subject is of public interest by allowing the defense to move to dismiss a case early in the litigation process unless the plaintiff can provide significant up-front evidence that the short sellers claims are false. When an anti-SLAPP motion is successful, a defendant who prevails is generally awarded reasonable costs of defense, shifting the entire costs of the litigation to the plaintiff, and dramatically reducing the ability to silence a truthful critic with litigation. Short sellers have prevailed in anti-SLAPP actions, e.g., GTX Global vs. Andrew Left (Citron Research), a case in which the target company could not provide sufficient evidence to demonstrate that the short seller made false statements.[5]

So why do firms sue short sellers? For small arbitrageurs, the cost of mounting a legal defense may be unbearable, and they may be forced to settle and retracting their report to make the lawsuit go away. Another possibility is that being litigious can deter regulators from pursuing enforcement actrions. Dechow, Ge, Larson and Sloan (2011) show that the SEC has a constrained enforcement budget, and selects targets based upon a cost-benefit analysis. Target firms that are expected to mount a costly battle against regulators may make themselves unattractive targets for enforcement actions compared to other potential enforcement targets. We find significant support only that litigious firms have worse outcomes through a significantly higher rate of delisting, we do not find a statistically significant association with enforcement actions, but this could be a

[5] GTX Global Corp v. Left, 2007 WL 1300065 (Cal Crt App, 2d Dist., 1997).

function of sample size, since short-seller lawsuits against short sellers appear to be relatively rare, occurring in only 6 percent of our report sample.

One of the most interesting disclosure choices in our setting is the decision to initiate an internal investigation, usually overseen by a committee of independent directors. This type of disclosure reveals a potential conflict of interest between management and the board (e.g., Bushman and Smith, 2001). Since the directors do not generally have the same level of access to information as management, and therefore may have trouble assessing the accuracy of the short sellers' claims, we predict that directors with greater uncertainty are less likely to authorize public responses which may be false, and if they have lost confidence in management, may take the significant step of publicly exercising their oversight through an announced investigation of the short sellers claims. We expect that initiating an internal investigation to determine the true state of the firm is a significant negative signal, as it implies that the firm's directors are not sufficiently confident in management to trust that the existing disclosures and management representations are accurate. Such a response is more likely when there are more severe allegations and for firms with foreign operations, which are presumably more difficult for directors to oversee. We find that internal investigation announcements are strongly associated with enforcement actions, a lower likelihood of acquisition, and a higher rate of begin delisted.

Our main outcome variables are delisting, enforcement actions (SEC auditing, accounting and enforcement releases, or AAERs), and when the firm is acquired, but we also consider less severe outcomes: shareholder class action lawsuits, restatements, director and officer turnover, and auditor turnover. The main outcomes are chosen because they either represent the end of the firms' life as a listed or independent firm (delisting and acquisition) or directly confirming fraudulent conduct by the target firm (AAERs).[6] We examine all the AAERs that follow the activist event for firms in our sample and find that 64% (14 of 22) directly address issues raised in the short seller reports.

We find that 25 percent of target firms delist within a year from the event date in our sample, some happening within days of the activist report being announced, reflecting a clear negative outcome that constrains access to the capital markets. AAERs occur in 6 percent of cases, far exceeding the base rate of about 0.36 percent for all listed firms (Dechow, Ge, Larson, and Sloan, 2011). Target firms are acquired following the report issuance in 18 percent of cases. While acquisition outcomes for target firms are not necessarily a good or bad outcome per se, we think it is descriptively an important to document the high rate of targets being acquired, as acquisitions can be a symptom of distress (e.g., Clark and Ofek, 1994). Being acquired indicates that the buyer believed the net assets of the firm were capable of being valued, which is potentially good news about the targeted firm, even if the overall sale represents a distressed outcome. We find that when activist short seller targets announce internal investigations, the disclosure is associated with a 383 percent greater chance of a fraud finding (AAER) and a 61 percent lesser chance of being successfully acquired as an exit strategy, compared to the whole sample of targeted firms.

To provide further evidence on how the nature of the activists' allegations impact disclosure decisions, we examine the content of activist reports. The average short seller report raises 5.6 separate issues, including accounting issues, business and product related issues, and disclosure compliance deficiencies. Fully 53 percent of short seller reports accuse the firm of perpetrating a securities fraud on investors, which we record as a separate issue. Ljungqvist and

[6] Ljungqvist and Qian (2016) also note that delistings and enforcement activities occur at high rates following activist short seller reports, but they do not consider the relation of these outcomes to firm or report characteristics, and they do not consider firm responses. We do not examine bankruptcies because these tend to occur long after our event period, and we often lose the ability to collect data on bankruptcies in cases where the firm is delisted, which we do study as an outcome.

Qian (2016) note that reports that merely present opinions of overvaluation are less effective in facilitating price discovery, compared to those that present new proprietary information. We follow their approach and code reports as to whether they produce new information. This new information is usually the result of investigations of target firms' operations or regulatory filings that are not readily available to investors. New information is provided in 53 percent of the reports in our sample.

An important caveat to our study is the descriptive nature of our evidence which precludes causal interpretation. While we model the decision to target a firm and consider this selection issue in the analyses of disclosure choices and outcomes, this setting presents significant endogeneity issues relating to the decision for an activist to target a firm, the market response and media attention to the short seller's report, the firm's disclosure choices, and the firm's outcomes.

Overall, our results indicate that firm responses to activist short sellers reveals information about the severity of the underlying allegations and therefore is useful to understanding disclosure incentives surrounding activist short sellers and the mechanisms by which potential overvaluation is corrected. We confirm prior literature's result that the overall price impact of short sellers appears to justify their credibility on average. And this can be explained by disciplining mechanisms which encourage broadly accurate reports, since short sellers face civil and criminal liability for making materially false statements, and their track record from past successful past campaigns serves to increase the attention to subsequent reports and can help win them additional capital to invest. The media attention that their reports generate, and the ire of managers and investors who deem themselves damaged by the activist's report, likely attract regulatory scrutiny of their claims. In short, activist short sellers who want to make money over time need to identify overvalued firms and provide factually accurate research that reveals the overvaluation. Managers and directors therefore need to pay attention when they are targeted by an activist short seller, as an assessment of the credibility of the accusations can inform actions that likely have a material bearing on the firms' prospects.

In Section 2 present a conceptual framework based on prior literature and offer predictions for our disclosure analysis. Section 3 describes the sample. In Section 4, we examine the activist's targeting decision. Section 5 provides time series evidence of the market impact, firm responses, and outcomes in the days and months surrounding the activist event. Section 6 investigates the decision to respond to the activist, and the relationship between allegations, firm responses and outcomes. Section 7 concludes.

2. Conceptual framework

The analysis presented in this paper relates to three branches in the existing literature. First, we speak to the literature on the behavior of short sellers and the credibility of their analyses (e.g., Dechow, Hutton, Meulbroek, and Sloan, 2001; Karpoff and Lou 2010; Engelberg, Reed, and Ringgenberg 2012; Lamont 2012; Ljungqvist and Qian 2016). Our paper is most closely related to Ljungqvist and Qian (2016), as we build upon the sample used in their study to explore firm disclosure choices.[7] Ljungqvist and Qian (2016) have a specific focus, which is to examine how activist short sellers overcome limits to arbitrage and correct overvaluations, not with their limited capital, but by inducing long holders to sell. Our contribution primarily lies in examining firm disclosure decisions in response to these short sellers, supported by our findings on the factors associated with being a target, the types of disclosures that firms make in response to activists, and

[7] In a contemporaneous unpublished working paper, Appel and Fos (2020) examine a set of activist short seller campaigns identified from media articles, finding that activist campaigns have incremental impact on target firm returns over that predicted by increases in short interest alone, consistent with media-covered short seller campaigns being credible.

the relation between these responses and a variety of outcome variables that can proxy for the underlying state of the firm.

Second, we relate to the literature on incomplete voluntary disclosure, specifically where managers possess an unknown information endowment (e.g., Dye 1985; Jung and Kwong, 1988; Dye and Sridhar 1995), where investors may have their own private information (e.g., Dutta and Trueman, 2002), and where managers have incentive to distort their disclosures (e.g., Dye, 1988; Fischer and Verrecchia, 2000; Beyer and Guttman, 2012). In cases where short sellers allege fraud, issues of managerial reputation and disclosure accuracy and completeness (e.g., Stocken 2000; Beyer and Dye, 2012) become acute.

Third, this paper relates to the literature on managers' learning from their stock price changes (e.g., Edmans, Goldstein, and Jiang, 2015; Zuo, 2016), in particular how managers' private information and decisions may be augmented by investors' private information, since managers observe the market response to the short seller allegations prior to determining their response action.

The aforementioned literature allows us to form some predictions on how managers will respond to activist short sellers, depending on the conditions surrounding the report disclosure. Consider four scenarios created by the public disclosure of an activist short seller's report: First the report may present generally truthful information, but that which is already impounded in prices, resulting in no price impact. Second, the report could provide truthful and material new information which had not then been impounded in prices, resulting in a significant decline in price at the report's release. Third, the report could contain false information, but the market assigns no weighting to the analysis and there is no price impact. Fourth, false but plausibly credible information is presented which may cause the target's stock price to decline temporarily until the false information is corrected (e.g., Mitts, 2018), or if the allegations are difficult to resolve, could resulting in unjustified longer-term price declines. These situations potentially create variation in incentives for management to make disclosures (e.g., Grossman, 1981) in response to the issuance of the short seller's report, and the disclosures, to the extent they reveal underlying state of the firm, may be associated with significant firm outcomes.

Prior to the short seller's report, the market is unaware that the target firm's management possesses unfavorable information, and so there is limited incentive to disclose (e.g., Dye, 1985; Jung and Kwon, 1988). Following the short seller's report, the market becomes aware of the possibility that managers have private information, and so, on average we predict that firms will increase their disclosures, either to reveal the private information or to refute that such private information exists. Since managers have a chance to observe the market response to the report before deciding to respond, the lack of a stock price response can signal to managers either that the report is uninformative or that a high fraction of investors are uninformed (e.g., Dye 1988). This prediction is also consistent with the literature on managers adjusting disclosures in response to market price signals (e.g., Badertscher, 2011; Sletten, 2012; Li and Zhang, 2015).

The simplest action by the firm involves doing nothing, as a response can legitimize the short seller and the firm's response creates further publicity of the short seller's views. If there is no market response to the short seller's report, in the cases where it is either truthful or false, there is no incentive for management to acknowledge the report with a response. When a decline the stock price indicates that the report has caused the marginal investor to reduce their estimate of the firm's value, the decision to disclose becomes salient. In the case where the firm is falsely accused and management and the directors are confident, the firm can safely deny the short seller's report and attack the analyst's credibility, to attempt to cure an undeserved price decline. In these cases, we predict a response is more likely.

When the short seller's allegations are accurate, target firms face conflicting incentives related to the costs of falsification (e.g., Beyer and Guttman, 2012) which in turn depends on the severity of the allegations made by the short seller. Allegations of fraud may cause significant price declines, and media and shareholder demands for information pressures managers to respond to the short seller's claims, since presumably investors would like to hear that the claims are false in order to minimize their economic losses. The cost of falsification to the firm in this setting, however, can offer mixed predictions.

Admitting the truth of a fraud claim will result in likely enforcement sanctions and management terminations, so a simple admission of guilt is unlikely, and we observe none in our sample.[8]

Making a false denial has some probability of forestalling an enforcement action, favoring such action if the penalty is small. In this setting, the attention raised by the activist may make an enforcement investigation likely, and a false denial may be quite likely to expose management to further sanctions, on top of those warranted by the initial short seller accusations. Therefore, we generally expect that firms will not make false denials, and would rather remain silent. Since bad firms remain silent, we might expect to see an unraveling result where all except the worst firms disclose.

[8] We are aware of one such case, Let's Gowex SA made just such an admission when confronted with a report from Gotham City Research. "I made a voluntary confession in court. I want to collaborate with justice. I will face the consequences," from the Financial Times, *WiFi provider Gowex goes bankrupt and admits falsifying accounts*, Buck, T. July 7, 2014. While Gotham City Research is a short seller in our sample, Let's Gowex is not included because it was listed in Madrid.

But this view is too simplistic since this voluntary disclosure setting presents the firm with different types of response, they do not just have to reveal the true state of the firm. Firms may selectively respond to the short seller or engage in litigation to present an unattractive target for the short seller or regulator to pursue. While voluntary disclosure theories give predictions about when firms are more likely to disclose, the decision to select from among the different types of disclosures we observe is also informed by prior literature. Examining the complete sample of firm responses, we find that there are a consistent set of disclosure types, which are not necessarily mutually exclusive. Disclosures can deny the activist's allegations (*denial*), provide additional disclosures to correct or augment the interpretation of the short seller's report (*additional disclosure*) make hostile statements which attack the short seller's credibility (*hostile*), initiate a lawsuit against the short seller for defamation (*lawsuit*), announce an internal investigation to evaluate the truth of the activist's claims (*internal investigation*) and against the short seller. If none of these disclosures are made, we conclude that the firm made *no response*.

In particular, Bushman and Smith (2001) find that the board of directors has incentives that differ from management and we therefore expect they will act to limit their personal liability by investigating the short seller's claims, in particular when they have knowledge or suspicions that the activist's allegations are true. The private information possessed by managers and the board is not always superior to that of outside investors (e.g., Zuo, 2016), meaning that the market response to the short seller report can alert directors to malfeasance within their firm. This literature provides a prediction that the disclosure of internal investigations should be associated with more severe outcomes for the firm as it reveals significant doubts about the state of the firm on the part of insiders.

Overall, this discussion of the literature with our setting makes several testable predictions about the overall disclosure choice as well as specific disclosure types, and what these disclosures reveal about the true state of the firm.

3. Data and overview

3.1. Sample construction

We begin with the sample used in Ljungqvist and Qian (2016) and extend their sample to 421 initial short selling reports by repeat arbitrageurs from 1996 to 2018 for US targets of activist short sellers. These observations are reduced by 33 by excluding firms trading OTC and another 37 for lack of availability of required financial data, resulting in the final sample size of 351 reports. This sample captures all reports written by these arbitrageurs, summarized in Table 1, Panel A, to ensure that there is no selection bias in the report-capture process, within the sample of repeat arbitrageurs who publish their opinions. We manually verify that we have captured all reports issued by these short sellers using the short sellers' web sites, internet archive, and platforms on which the firms' analyses are distributed such as SeekingAlpha.

[Insert Table 1 about here]

This is believed to be a relatively complete list of arbitrageurs who publicly issue multiple reports over the time period of our study, and for whom we are able to capture a complete record of their reports. We do not capture larger professional hedge funds that do not systematically publish their research, but periodically announce a short position through media interviews or conference presentations. Examples of these investors include Jim Chanos of Kynikos Associates, primarily a short seller, and David Einhorn of Greenlight Capital, a long-short hedge fund manager.

Table 1, Panel A, provides basic descriptive statistics for the report sample. The most prolific activist short sellers in our sample include Spruce Point, Richard Pearson, GeoInvesting, and Citron Research, with more than 25 reports each over the sample period. We examine the rate at which different activists generate target firm responses, on a univariate basis, where we include a column to tabulate the fraction of reports that result in target firm responses for each activist, which illustrates an overall company response rate of 31 percent. There is significant variation among activist short sellers in achieving a management response, for example with Richard Pearson achieving a response rate of 13 percent, whereas Glaucus Research achieves a response rate of 86 percent.

To illustrate how the prevalence of new evidence and fraud allegations vary by short seller, Table 1 Panel A also reports the proportion of each activist's reports that make fraud allegations and provide new evidence, by activist. The rate at which these features are present in short seller reports varies significantly. For example, Kerrisdale Capital reports only allege fraud in 30 percent of cases whereas Alfred Little alleges fraud in 100 percent of reports. Firms also vary in their production of new evidence, with Ascensio & Co. entirely relying entirely on existing evidence (0 percent new evidence), and Gotham City Research presenting new evidence in 100 percent of reports. As a result, allegations of fraud and the provision of new evidence vary by short seller.

After collecting all initial reports, we read the short seller reports ourselves to describe the types of allegations that short sellers make. Table 1, Panel B, illustrates the rate at which various allegations occur in short seller reports.[9] We code indicator variables for what we observe to be the major categories: accounting issues (i.e., issues with revenues, expenses, income, cash flows, assets, liabilities, non-GAAP presentation, auditor issues), disclosure issues (incomplete

[9] Ljungqvist and Qian (2016) provide a similar table of report topics.

disclosures, serious errors in disclosures), product and business issues (product quality, Ponzi schemes, inherently unprofitable products, related party transactions, fabricated customers, poor acquisitions or divestitures), management issues (past frauds, management turnover, competence). Finally, we code an indicator variable for short sellers' opinion on the severity of the allegations leading to announcing an opinion that the firm is committing securities fraud, by making an explicit statement to that effect (e.g., "…management of Textura is committing FRAUD on the investing public." [emphasis in the original]). We also code an indicator for new information, similar to the variable used in Ljungqvist and Qian (2016), to identify the reports that they find are more credible. *New evidence* is an indicator equal to one when the short seller presents information that has not already been disclosed in securities filings, which we observe when the short seller publishes material gathered using private investigators or local regulatory filings that are not readily available to investors, such as foreign company registry documents. Appendix A provides further detail and illustrates how a sample report is coded along these various dimensions.

On average, 5.71 total issues are raised in activist short seller reports. Accounting issues occur per report 1.82 and at least one accounting issue is mentioned in 65 percent of reports. The most common issues reflect audit and internal control issues, revenue concerns, and asset accounting (39, 30, and 28 percent of reports, respectively). An average of 1.38 business-related issues are raised per report, with fundamental business concerns present in 74 percent of reports. Business concerns include a relatively broad range of issues about the sustainability of the business, such as evidence that the scope of the firm's operations are misrepresented, that the company's products or services are deficient or predatory, the model is inherently unprofitable or a Ponzi scheme, that claimed customers do not exist. In some cases, different allegations are interrelated, for example a business concern involving fabricated customers implies that revenue is misstated. In summary, short sellers target firms with a variety of issues present.

Table 1, Panel C, provides descriptive evidence of the changing nature of activist short selling over time. The main takeaway is that the rate at which activists produce short selling campaigns has increase dramatically, especially following the financial crisis, when a significant number of firms failed. The response rate has ebbed and flowed over time, a pattern to which we are hesitant to attribute to attribute to any particular factors, and has ranged from 13 to 46 percent of campaigns in the 2008 to 2018 period, arriving at the overall average of a 31 percent response rate. The rate of reports releasing new evidence and making accusations of securities fraud is 55 percent and 54 percent, respectively, with the incidence of both being somewhat more prevalent in recent years. Accounting and disclosure issues are present at a rate of 65 percent each, a rate that is consistent over time. Business issues and management issues are present at rates of 87 and 58 percent respectively, and these levels are also consistent over time. Overall we find that both the content and response rate to activists has been largely stable over time.

[Insert Table 2 about here]

Ljungqvist and Qian (2016) show that short seller reports revealing new evidence are more significant predictors of negative returns. We confirm that this result holds in our expanded sample, shown in Table 2, with initial announcement returns of -9 percent for new evidence reports and 2 percent (not significantly different from zero) for no-new evidence reports. However, when we look to total abnormal returns over the one year period beginning with the day prior to the activist announcement, CAR[-1,+252], we find that the returns are similar for both new evidence and no-new evidence reports (-33 percent and -34 percent respectively). This provides evidence that while new evidence reports are more salient and likely more profitable for short sellers, the allegations of overvaluation appear to be of similar magnitude whether or not new evidence is present.

We also look to see if securities fraud allegations made by short sellers offer credible indications of more severe overvaluation. Securities fraud allegations are associated with similar announcement returns as new evidence reports, with announcement returns of -10 percent for fraud allegations, and a return of 3 percent (not significant) without fraud allegations. These reports have some overlap with new information reports but overall reflect substantially different sets of reports, having a correlation of 0.27. In addition to the initial price response differential, there is significant downward drift for firms with fraud allegations with total abnormal returns for the year being -37 percent for firms with fraud allegations compared to -27 percent for firms without fraud allegations. As a result, fraud allegations appear to distinguish firms with marginally greater overvaluation, and a valuation gap of 10 percent persists for fraud- and non-fraud-allegation firms over the subsequent year.

The second area of data collection is to identify the types of management responses to short seller reports. We hand-collect press release and news articles from Factiva, conference call transcripts from Thomson Reuters Eikon, litigation from Audit Analytics, and 8-Ks from EDGAR for evidence of management's response to short-seller reports. We record an indicator and the date of any publicly disclosed response by management if it occurs within two weeks of the short seller report date and specifically addresses allegations made in the report. Where the firm responded to the short-seller report, we hand code indicator variables for the nature of the responses, which are not mutually exclusive. We identify if the response included a denial of allegations made by the short seller, if the response was hostile to the activist (for example, disparaging the short seller by name, criticizing the motives or quality of the analysis, threating a lawsuit or alleging market manipulation), if the response was constructive (by responding to the allegations in the report without disparaging the short seller), if the firm threatens or files a lawsuit against the short seller, if the firm announces an internal investigation into the short seller's allegations, and if the firm provided additional disclosures. Details and an example of coding a target firm's response can be found in Appendix B.

[Insert Table 3 about here]

The results in Table 3, Panel A, illustrate the fraction of firms electing a response option, as well as the incidence of each type of outcome measure, conditional on the response option. For example, 28 percent of firms make a denial, illustrated in the *All Outcomes* column. Of firms that make a denial, 3 percent receive an AAER following the activist campaign (*AAER* column).

The basic observation of any response is not particularly predictive of an outcome, on a univariate basis. Firms that respond are less likely to have an AAER (14 percent) more likely to be delisted (8 percent) more likely to be acquired (47 percent) less likely to face a class action lawsuit (13 percent) less likely to have a restatement (29 percent), manager change (16 percent), or auditor change (14 percent). Overall making a response is associated with less negative outcomes, and a significantly greater chance of being successfully acquired.

Considering the types of responses, we find that denials of the short seller allegations occur for 29 percent of activist campaigns, 6 percent involve a hostile response or lawsuit, and 4 percent result in an internal investigation, 12 percent of cases result in additional disclosures. Certain response types have interesting implications. Firms that announce internal investigations (4 percent of observations) have a 29 percent incidence of receiving an AAER, far exceeding the mean rate of 6 percent (a 383 percent greater likelihood), a 93 percent greater chance of having a restatement, and a 200 percent greater chance of an auditor change, but a 61 percent lesser chance of being successfully acquired.

If we consider insider trades, 26 percent of managers and directors are net sellers of shares in the two weeks following the activist report, whereas only 15 percent are net purchasers.

Initial returns to the short seller report publication are associated with disclosure choices. The announcement return (CAR[-1,1]) for all reports is -7 percent, and the return associated with disclosure firms is -14 percent, while the return for no-response firms is 0 percent. The returns for the following quarter are similar at -13 to -15 percent for the subsequent 60 days for responding and non-responding firms respectively (not significantly different). After a year, the returns are similar either way. Among the specific disclosure choices, long term returns are relatively homogenous across subsequent periods. After one year, firms that sue short sellers have the worst returns at -46 percent, and firms that make additional disclosures have the best returns at -32 percent. Overall, the simple act of making a disclosure reveals relatively little information in terms of stock price response, although in other outcomes, the differences appear material.

Are responding firms and non-responding firms observably different? Panel C of Table 3 shows the difference in firm characteristics for responding and non-responding firms. The only statistically significant difference is in profitability, with responding firms being more profitable (ROA of -0.008) compared to non-responding firms (ROA of -0.119). Responding firms have similar analyst followings and levels of institutional ownership, though they tend to have higher M-scores (*manipulator*), but at statistically insignificant levels.

4. The targeting decision

[Insert Table 4 about here]

What are the characteristics of activist short seller targets? We provide descriptive analysis of the types of firms targeted by short sellers to understand potential ways in which firms are targeted. Table 4 presents univariate descriptive statistics of targeted firms in our sample, as well as a comparison to the Compustat universe of listed stocks over the same time period as our short seller reports. The sample includes all listed firms in CRSP and Compustat with the necessary data availability to calculate the covariates, from 1996 to 2018. We find that firms targeted by short sellers are generally smaller than the Compustat average, approximately half the size (2,240 million for targeted firms versus 3,847 million for listed Compustat firms). Targeted firms are also different on many other dimensions: they have lower Book-to-Market ratios, lower leverage, higher analyst following, are more likely to be foreign, have higher litigation risk, higher short interest, higher Tobin's Q, lower dividend yields, are less profitable, and are more likely to be earnings manipulators.

[Insert Table 5 about here]

In addition to the univariate descriptive statistics previously discussed, Table 5 presents a probit regression to investigate the multivariate determinants of targeting, and the partial effects of the covariates. The dependent variable is an indicator equal to 1 if the firm-year observation was subject to an activist short-seller report in our sample, and 0 otherwise. The unconditional probability of being targeted by one of the activists in our sample was 0.22%.

The results in Table 5 are largely consistent with the results in Table 4, although we do not find that size is a determinant of being targeted after controlling for other factors. Compared to non-targeted firms, book to market is lower, Tobin's Q is higher, ROA is lower, leverage is lower, and dividend yields are lower. These results seem sensible in the short selling setting, since they are factors associated with overvaluation and a lower cost of shorting, since the short seller has to pay cash dividends on borrowed shares. In addition, target firms are significantly more likely to be labeled as manipulators using the M-score, to be recently listed, and to be foreign. These factors are associated with potential for distorted earnings, and in particular foreign firms may have lower ability for enforcement actions to provide a credible deterrent to management. The higher short interest indicates that activist short sellers are attracted to firms that have already been identified by the market as potentially overvalued. High short interest is also associated with higher borrowing costs and greater limits to arbitrage, and therefore the publication of a report is a more attractive way to resolve the overvaluation.

5. Time series evidence: market impact, media, firm responses, and outcomes

[Insert Figure 1 about here]

The patterns of activity around the activist event can provide additional descriptive insight into the response to the short sellers report. Figure 1 illustrates a number of relationships for market, firm response, and outcome measures in the days leading up to and following the activist short sellers report disclosure. Panel A illustrates cumulative abnormal returns surrounding the activist event, and is similar to that shown in Appel and Fos (2020), and is consistent with the magnitudes of returns reported in Ljungqvist and Qian (2016), although they only show the cumulative returns in the period following the report. There is a dramatic 20 percent increase in the stock price of the targets on average in the 90 days preceding the activist report disclosure, and a rapid drop on the day of the report release, with further downward drift for the subsequent 90 days, as previously discussed. Panel B shows media attention, with abnormal media spiking more than 261 percent on the day of the report disclosure.

Panel C illustrates the pace at which firms make disclosures in response to the short seller reports. Most reports happen during the first week following the activist report, with some disclosures coming in the subsequent months, but at a much lower rate.

Panel D provides time series evidence of steadily increasing short interest up through the event date, with only a small decline in the following 90 days (also consistent with Appel and Fos, 2020). Both the increases in stock prices and short interest may be signals that catch the attention of short sellers prompting them to investigate the firm further.

Panel E illustrates the rate of delisting for target firms, and we see delistings jump to a rate of 0.28 to 0.85 percent per day in the 5 days following the report release.[10] Although the absolute percentage of firms on a daily basis are small, this rapid delisting of many firms in our sample is evidence of the compelling nature of a number of the activist short reports. Panel F confirms similar activity with class action lawsuit filings against the target firm, with numerous filings occurring immediately following the event, as is typical after a greater than 10 percent stock price decline (e.g., Lev and De Villiers 1994). There are almost no lawsuits in the period preceding the short sellers report, indicating that such lawsuits are likely not used by short sellers to identify targets.

[Insert Figure 2 about here]

In Figure 2, we examine a longer time series of outcomes using monthly observations from three years prior to three years following the activist event. In Panel A, we see significant delistings in the months immediately following the event (there are none in the pre-period by construction),

[10] When we manually inspect the reasons for such rapid delistings, we find that they are initiated by the NYSE or NASDAQ exchanges on a discretionary basis for the protection of investors (e.g., NASDAQ Listing Rule 5101, Section 1009(d) of the NYSE Company Guide), and is then supported by other listing rules such as failures to provide adequate responses to exchange inquiries, or fail to file when due forms with the SEC.

with generally 1 to 3 percent per month being delisted. With AAERs, we only see a few in the three years following the event, illustrated in Panel B. Due to the long time to investigate, prosecute, and settle a case, it is difficult to observe AAERs in a window of even three years. Ljungqvist and Qian (2016) report a median of 640 days and a 75th percentile of 1,177 days for regulatory interventions to occur. We note that there are a significant number of AAERs in the pre period, indicating that short sellers likely use AAERs as a targeting mechanism, perhaps on the assumption that firms with proven fraudulent managers still operating may be much more likely to be engaging in repeated fraud. Panel C shows that restatements are reasonably persistent throughout the time period, but are somewhat denser in the six months following the short seller event, indicating the activist report does prompt auditors to reevaluate their assumptions. Comparing the aggregate 12 months prior to the 12 months following the event, restatements happen at a rate of 8.0 percent in the pre period and 16.5 percent in the post period, an increase of 107 percent. Panel D further illustrates auditor changes, and there is an increase of 52 percent from the pre-period to the post-period. Panel E shows a 32 percent increase in the rate of director and officer turnover following the activist report. In total, the monthly time series patterns indicate significant outcomes effects as a result of activist short seller reports.

6. Target firm responses and outcomes

6.1. Target firm responses to activist short sellers

[Insert Table 6 about here]

We next examine the decision to respond and the type of response in a multivariate setting, using the inverse Mills ratio from the selection regression in Table 5 to control for the sample selection bias that we only observe response decisions for firms that have been targeted, and we remove book to market and Q from the subsequent regressions to satisfy the exclusion restriction as these variables are not significantly associated with responses or outcomes. Table 6 presents a summary of the probit and OLS regression coefficients of firm response types on three key variables that proxy for activist report credibility: securities fraud claims, new evidence, and the initial stock price response. We include a full set of control variables and the OLS versions report specifications with no fixed effects, year fixed effects only, and year and activist firm fixed effects, so that we can observe the full set of variation, as well as variation within firms and years.

The results show that allegations of securities fraud are associated with a firm making any response but with limited predictive power for specific response types. New evidence is strongly predictive of any response, denials, hostile responses, and lawsuits. Only in the probit specification does the initial stock price have an effect, with negative stock returns being associated with higher probabilities of any response, denials, hostile, and internal investigations.

6.2. Allegations and Future Outcomes

[Insert Table 7 about here]

Table 7 performs a similar set of analyses with a set of regression coefficients for models of outcome variables on specific report allegations to understand the contribution of specific report characteristics compared to the overall credibility measures, new evidence and securities fraud. We find some interesting variation that provides insights for investors and mangers as to which allegations can have more material effects.

For the delisting outcome, *accounting issues* allegations are associated with approximately a 9 to 11 percent increase in delistings. Allegations of *business issues* are associated with a lower likelihood of being delisted (22 percent reduction in marginal probability, 13 to 21 percent reduction in the OLS specifications). Enforcement outcomes are significantly less likely to result following *business issue* allegations, which is not surprising as these issues often don't allege fraud, simply attempt to identify a weak business.

Being acquired is significantly less likely when one is accused of securities fraud (11 to 14 percent less likely). We don't find that any allegations are significantly associated with shareholder class action lawsuits, as these are primarily a result of the stock price move rather than a specific fact pattern. Restatement outcomes are less likely with business allegations (12 to 16 percent reduction), again unsurprising since these issues do not allege accounting issues. Interestingly, we find no significant ability to reject the null hypothesis of no effect for accounting issues, which we would expect to relate to restatements. Both director and officer changes and auditor changes are also seemingly unrelated to specific allegation types.

6.3. Firm responses and outcomes

[Insert Table 8 about here]

In our final analyses we examine the relationship between firm responses and outcomes. Table 8 provides regression summaries for models of outcomes regressed on firm disclosure types. As in the previous two analyses, we provide probit and OLS models with fixed effects for year and short seller.

We find significant variation in these outcomes, after controlling for firm factors and market responses. For the delising outcome, hostile responses are associated with a 26 to 32 percent reduction in the likelihood of being delisted, while suing the short seller and launching an internal investigation are associated with an increase in delisting likelihood of 29 to 46 percent and 13 to 16 percent respectively. The only disclosure choice that is significantly associated with receiving an AAER is the internal investigation disclosure, resulting in a 19 to 22 percent increase in the OLS specifications, and a 9 percent increase in the probit model. Internal investigations also have a s21 to 24 percent lower likelihood of being acquired consistent with our predictions. We find that firms engaging in lawsuits against short sellers are significantly less likely to file restatements, although this result is largely empirical as we do not have a prediction on this relationship.

Overall, these analyses illustrate that disclosure choices are strongly associated with a number of significant firm outcomes though we caution that the results are descriptive rather than causal given the inherent endogeneity among the targeting decision, allegations, disclosure choices, and underlying state of the firm revealed in this set of outcomes.

7. Conclusion

Activist short sellers are effective at identifying overvalued firms, and how managers respond to such campaigns is an important question as we show that both the reports and managements disclosure decisions are related to important economic outcomes. While largely descriptive, this study makes an important contribution to the literature on activist short sellers, whose growing prominence demands study. These short sellers identify and publicize allegations of overvaluation, and frequently fraud, to induce long shareholders to sell and thereby to profit from the resulting price decline. Our descriptive evidence shows that firms make several distinct types of disclosures in response to activist short seller campaigns, as they can respond by making denials, attacking the short seller's credibility, suing the short seller, and releasing additional information. The most important disclosure is when firms announce internal investigations launched by the board as these firms are significantly more likely to be delisted, face enforcement action, and are less likely to become an acquisition target. This is by no means a causal relationship, for an investigation does not cause the underlying malfeasance to take place. Rather the disclosure choices reveal the true state of the firm and we can observe characteristics of that state through a variety of outcomes. Our analysis provides important new evidence on the role of activist short selling and the information revealed in target firm responses.

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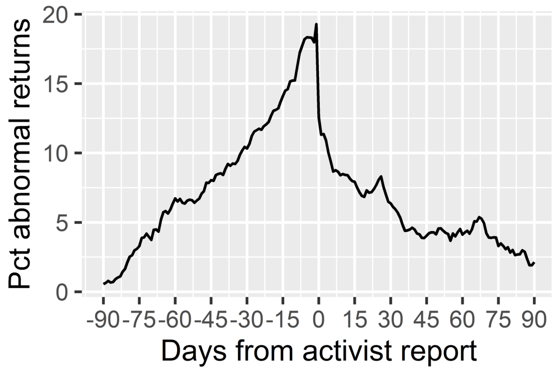
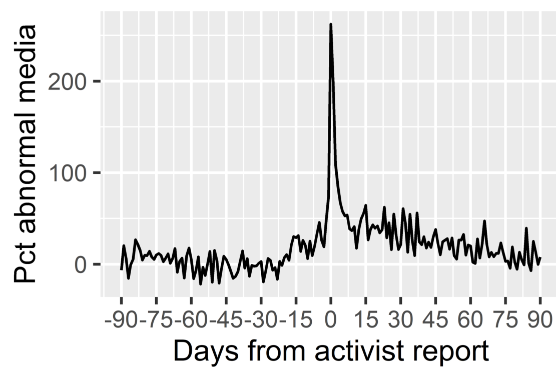
Figure 1. Daily descriptive statistics surrounding activist short seller events

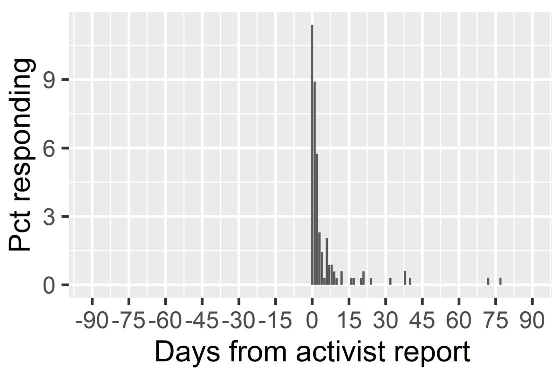
Panel A: Cumulative abnormal returns



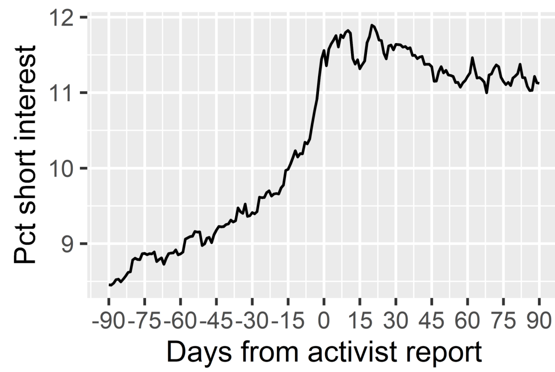
Panel B. Abnormal media mentions



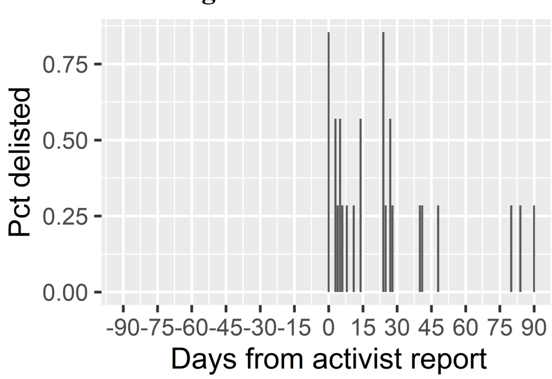
Panel C. Firm responses



Panel D. Daily short interest



Panel E. Delistings



Panel F. Class action lawsuits

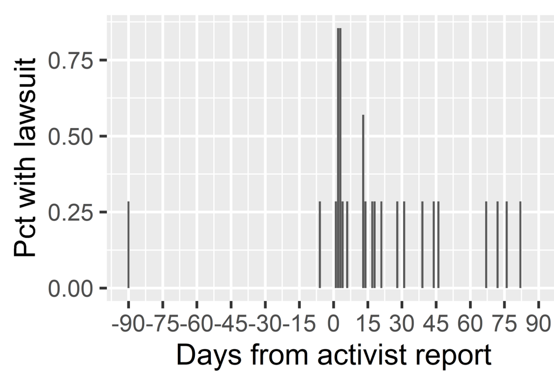
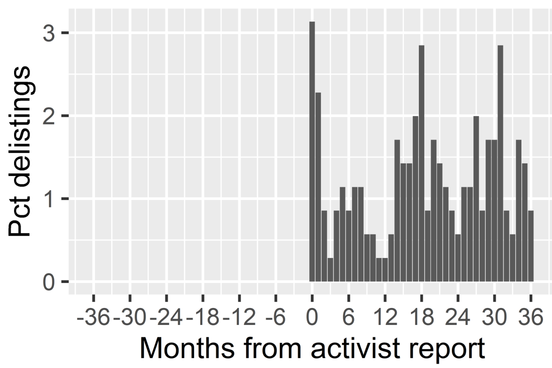
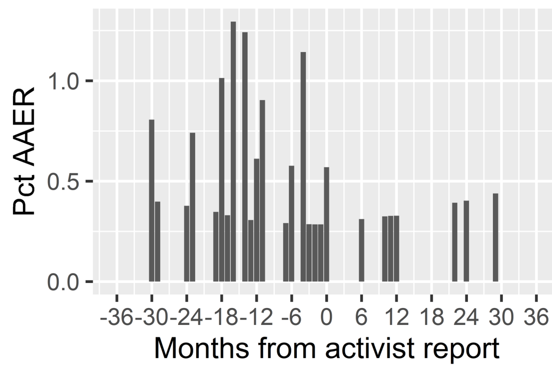


Figure 2. Monthly descriptive statistics surrounding activist short seller events

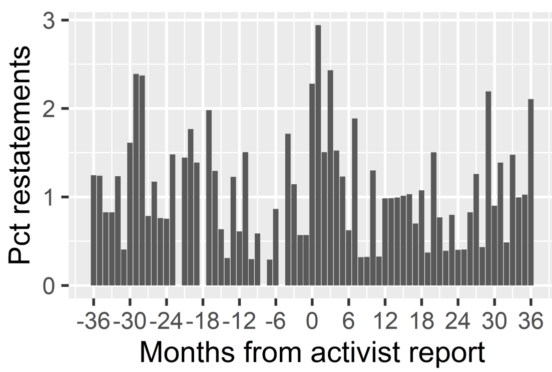
Panel A. Delistings



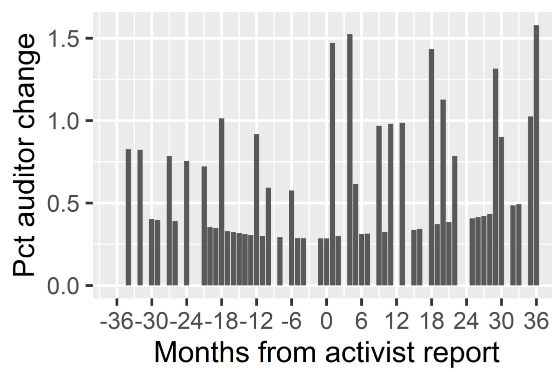
Panel B. AAERs



Panel C. Restatements



Panel D. Auditor changes



Panel E. Director and officer changes

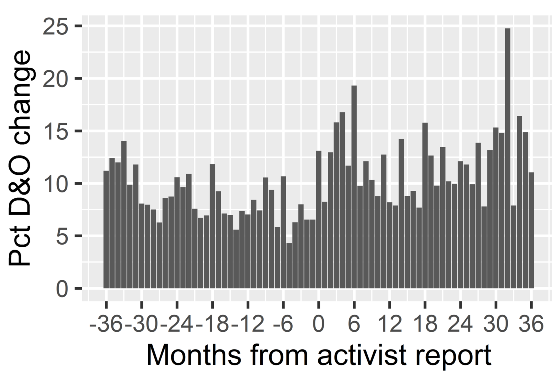


Table 1: Summary statistics for activist short sellers

The sample contains details of the 351 reports from 25 activist short sellers on US-listed target firms from 1996 to 2018. Fraud allegations, new evidence and any response are the proportion of reports that allege securities fraud, that present new evidence, and to which companies respond to the short seller's allegations via press releases, conference calls, or Form 8-K filings, respectively. See Appendix C for variable definitions.

Panel A. Activist short seller characteristics

#	*Activist short seller*	*# of reports*	*Fraud allegation*	*New evidence*	*Any response*	*Mean CAR [-1,+60]*
1	Spruce Point	42	0.64	0.93	0.21	-0.14
2	Richard Pearson	41	0.59	0.56	0.15	-0.19
3	GeoInvesting	34	0.47	0.35	0.32	-0.26
4	Citron Research	29	0.41	0.59	0.34	-0.23
5	Asensio & Co.	24	0.46	0.00	0.50	-0.33
6	Kerrisdale Capital	23	0.30	0.35	0.26	-0.25
7	Bleecker Street Research	17	0.59	0.59	0.12	-0.24
8	Pump Stopper	17	0.82	0.88	0.18	-0.25
9	Muddy Waters	16	0.75	0.88	0.75	-0.19
10	Bronte Capital	15	0.47	0.00	0.13	-0.09
11	Prescience Investment	14	0.64	0.93	0.50	-0.09
12	Xuhua	11	0.27	0.27	0.09	-0.12
13	Aurelius Value	9	0.78	0.78	0.67	-0.23
14	Shareholder Watchdog	9	0.33	0.11	0.00	-0.25
15	Glaucus Research	7	0.29	0.57	0.86	-0.21
16	Gotham City Research	7	0.57	1.00	0.71	-0.27
17	Alfred Little	6	0.83	0.83	0.50	-0.18
18	Chimin Sang	5	0.40	0.40	0.20	-0.16
19	Street Sweeper	5	0.40	0.00	0.00	0.45
20	Absaroka Capital Management	4	0.75	1.00	0.75	-0.18
21	Anonymous Analytics	4	0.50	0.50	0.75	-0.01
22	Chinese Company Analyst	4	1.00	0.00	0.00	-0.11
23	The Emperor Has No Clothes	3	0.33	0.67	0.00	2.49
24	Viceroy Research	3	0.33	1.00	0.00	0.05
25	ForensicFactor	2	0.50	1.00	0.50	-0.31
	Total	351	0.54	0.55	0.31	-0.05

Panel B: Types and frequency of allegations made in activist short seller reports
Appendix A provides detail regarding each classification and sample passages from a coded short seller report based on the 351 short seller reports.

Allegation Topic	*Mean (Incidence)*
Accounting issues	1.82 (0.65)
Audit and internal control	0.39
Revenues	0.30
Assets	0.28
Income	0.26
Cash flows	0.17
Expenses	0.16
Liabilities	0.13
Non-GAAP	0.12
Disclosure Issues	0.84 (0.65)
Serious errors in disclosure	0.46
Incomplete disclosures	0.38
Business Issues	1.38 (0.87)
Business	0.74
Product	0.36
Acquisitions and divestures	0.28
Management Issues	0.58
Securities Fraud	0.54
New Evidence	0.55
Total	5.71

Panel C. Annual activist short seller reports and topic incidence by year
This tables provides an historical overview of reports and topic incidence for the 351 events over the whole sample period.

Year	# of reports	Any response	New evidence	Securities fraud	Accounting issues	Disclosure issues	Business issues	Management issues
1996	2	0.50	0.00	0.50	0.50	0.50	1.00	0.00
1997	1	1.00	0.00	0.00	0.00	1.00	1.00	1.00
1998	6	1.00	0.00	0.83	0.33	0.83	0.83	0.50
1999	2	1.00	0.00	0.00	0.50	1.00	1.00	0.00
2000	-	-	-	-	-	-	-	-
2001	4	0.00	0.00	0.50	0.25	0.50	0.75	0.25
2002	1	0.00	0.00	0.00	0.00	0.00	1.00	0.00
2003	-	-	-	-	-	-	-	-
2004	1	0.00	0.00	1.00	1.00	1.00	1.00	1.00
2005	1	0.00	0.00	0.00	1.00	1.00	0.00	0.00
2006	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00
2007	4	0.00	1.00	0.50	1.00	1.00	0.25	1.00
2008	4	0.25	0.75	0.25	0.50	0.25	1.00	0.75
2009	7	0.14	0.00	0.14	0.57	0.43	0.86	0.29
2010	24	0.13	0.38	0.46	0.67	0.63	0.83	0.42
2011	48	0.46	0.60	0.60	0.79	0.77	0.75	0.69
2012	20	0.40	0.60	0.60	0.65	0.60	0.95	0.65
2013	42	0.31	0.45	0.38	0.64	0.55	0.86	0.55
2014	46	0.17	0.72	0.65	0.59	0.59	0.87	0.63
2015	40	0.28	0.48	0.53	0.63	0.65	0.95	0.63
2016	29	0.38	0.59	0.52	0.66	0.55	0.93	0.62
2017	36	0.36	0.67	0.58	0.69	0.78	0.94	0.58
2018	32	0.25	0.75	0.63	0.66	0.69	0.97	0.53
Total	351	0.31	0.55	0.54	0.65	0.65	0.87	0.58

Table 2: Abnormal returns for new evidence and fraud allegation reports

Cumulative abnormal returns (CARs) over the report announcement (-1,+1), the subsequent three month (+2,+60), year (+2,+252), and full (-1,+252) windows. Statistical significance on the abnormal returns is based on a t-test of the mean difference from zero. *. **. and *** indicate statistical significance at the 10%. 5%. and 1% levels respectively. Statistical significance on the abnormal returns is based on a t-test of the mean difference from zero. *, and *** indicate statistical significance at the 10%. and 1% levels respectively.

	New evidence	*No new evidence*	*Mean diff.*
CAR [-1,+1]	-0.09***	0.02	-0.11
CAR [+2,+60]	-0.11***	-0.17***	0.06
CAR [+2,+252]	-0.27***	-0.36***	0.09
CAR [-1,+252]	-0.31 ***	-0.35***	0.03
	Fraud allegation	*No fraud allegation*	
CAR [-1,+1]	-0.10***	0.03	-0.13
CAR [+2,+60]	-0.16***	-0.11***	-0.04
CAR [+2,+252]	-0.33***	-0.28***	-0.05
CAR [-1,+252]	-0.37***	-0.27***	-0.10

TABLE 3: Target firm outcomes by response type

Panel A. Cross tabulation of the fraction of events by target firm response and outcome

This tables relates the fraction of events by each combination of target firm response and target firm outcome for our sample of 351 short seller reports to firm outcomes. See Appendix C for variable definitions.

Disclosure type	Target firm outcome								
Target firm response	*All Outcomes*	*AAER*	*Delisting*	*Acquired*	*No Severe Outcome*	*Shareholder Class Action*	*Restate-ments*	*Manager Change*	*Auditor Change*
Denial	0.28	0.03	0.26	0.22	0.49	0.19	0.10	0.43	0.06
Hostile	0.06	0.00	0.33	0.14	0.52	0.33	0.14	0.38	0.05
Lawsuit	0.06	0.00	0.50	0.10	0.40	0.25	0.05	0.35	0.05
Internal investigation	0.04	0.29	0.50	0.07	0.14	0.29	0.29	0.36	0.21
Additional disclosure	0.12	0.02	0.30	0.23	0.44	0.14	0.12	0.40	0.05
Any response	0.31	0.06	0.26	0.22	0.47	0.20	0.12	0.42	0.06
No response	0.69	0.07	0.24	0.15	0.55	0.23	0.17	0.50	0.07
All Reports	*1.00*	*0.06*	*0.25*	*0.18*	*0.51*	*0.22*	*0.15*	*0.46*	*0.07*

Insider trades	*Incident*	*AAER*	*Delisting*	*Acquired*	*No Severe Outcome*	*Shareholder Class Action*	*Restate-ments*	*Manager Change*	*Auditor Change*
Sell response	*0.26*	*0.03*	*0.16*	*0.17*	0.63	0.26	0.16	0.57	0.08
Buy response	*0.15*	*0.06*	*0.23*	*0.17*	0.55	0.25	0.25	0.60	0.08

Panel B. Cumulative abnormal returns by firm response type

Cumulative abnormal returns (CARs) over the report announcement (-1/+1), the subsequent three month (+2/+60), year (+2/+252), and full (-1.+252) windows. Statistical significance on the abnormal returns is based on a t-test of the mean difference from zero. *. **. and *** indicate statistical significance at the 10%. 5%. and 1% levels respectively. Statistical significance on the abnormal returns is based on a t-test of the mean difference from zero. *, and *** indicate statistical significance at the 10%. and 1% levels respectively.

	Mean CAR			
	[-1,+1]	[+2,+60]	[+2,+252]	[-1,+252]
Denial	-0.14***	-0.16***	-0.30***	-0.37***
Hostile	-0.18***	-0.13	-0.32**	-0.40***
Lawsuit	-0.16**	-0.17**	-0.39***	-0.46***
Internal investigation	-0.24***	-0.18	-0.27	-0.35**
Additional disclosure	-0.13*	-0.11*	-0.23**	-0.32**
Any response	-0.14***	-0.15**	-0.29***	-0.36***
No response	0.00	-0.13***	-0.31***	-0.31***
All Reports	*-0.07****	*-0.14****	*-0.30****	*-0.34****

Insider trades	[-1,+1]	[+2,+60]	[+2,+252]	[-1,+252]
Sell response	*0.26*	*-0.14**	*-0.28****	*-0.24***
Buy response	*0.15*	*-0.15***	*-0.36**	*-0.26*

Panel C. Comparison of responding and non-responding firms

This table provides a comparison of responding (N=109) and non-responding firm (N=242) based on observable characteristics. Statistical significance is based on a t-test of the mean difference from zero. *, and *** indicate statistical significance at the 10%. and 1% levels respectively.

Comparison of response and no response firms			
Variables	Response firms	No response firms	Difference in Mean
Log market cap	2,309.46	2,209.43	100.03
BTM	0.44	0.45	-0.01
Q	3.74	4.00	-0.26
ROA	-0.01	-0.12	0.11***
Leverage	0.17	0.14	0.02
Dividend yield	0.01	0.01	0.00
Analysts	1.42	1.45	-0.03
Institutional ownership	0.34	0.36	-0.02
Manipulator	0.36	0.24	0.11
IPO	0.17	0.15	0.01
Litigation risk	0.30	0.37	-0.07
Foreign	0.46	0.36	0.10
Short interest	0.07	0.07	0.00

TABLE 4: Descriptive statistics for target and all Compustat firms

This tables provides an overview of the target firm characteristics (N=351) with comparison to the full Compustat universe (N=16,283). See Appendix C for variable definitions.

Firm characteristics	*Mean*	*Std. dev.*	*Lower quartile*	*Median*	*Upper quartile*	*Mean of Compustat/CRSP universe*	*Mean diff. - P-value*
Market cap	2,240.50	6,398.61	189.88	531.31	1,358.14	*3,846.52*	*0.00*
BTM	0.45	0.66	0.15	0.31	0.54	*0.64*	*0.01*
Leverage	0.15	0.20	0.00	0.05	0.26	*0.22*	*0.00*
Analysts (log)	1.44	1.00	0.69	1.61	2.20	*1.23*	*0.00*
Institutional ownership	0.35	0.35	0.01	0.23	0.65	*0.33*	*0.13*
Foreign	0.39	0.49	0.00	0.00	1.00	*0.13*	*0.00*
Litigation risk	0.35	0.48	0.00	0.00	1.00	*0.23*	*0.00*
Short interest	0.07	0.07	0.01	0.04	0.10	*0.02*	*0.00*
Q	3.92	4.01	1.55	2.48	4.61	*2.47*	*0.00*
Dividend yield	0.01	0.02	0.00	0.00	0.00	*0.02*	*0.00*
ROA	-0.08	0.39	-0.13	0.03	0.13	*-0.04*	*0.01*
Manipulator	0.28	0.45	0.00	0.00	1.00	*0.16*	*0.00*
Pre insider purchases	0.10	0.30	0.00	0.00	0.00	-	-
Pre insider sales	0.72	0.45	0.00	1.00	1.00	-	-
Post insider purchases	0.15	0.36	0.00	0.00	0.00	-	-
Post insider sales	0.26	0.44	0.00	0.00	1.00	-	-
Earnings announcement	0.14	0.35	0.00	0.00	0.00	-	-
Avg pre-returns	0.01	0.34	-0.09	-0.03	0.02	-	-
CAR[-1,+1]	-0.04	0.61	-0.14	-0.06	-0.01	-	-
CAR[+2,+60]	-0.14	0.31	-0.32	-0.14	0.03	-	-
CAR[+2,+252]	-0.30	0.48	-0.68	-0.41	0.02	-	-

TABLE 5: Probit analysis of being targeted

This table reports a probit regression of the probability of being targeted by an activist short seller in our sample. The dependent variable is an indicator variable equal to one if an activist short seller targets the firm-year observation. based on the prior year end realization of the financial variables. See Appendix C for variable definitions. The marginal probability column indicates the change in probability of targeting induced by a one-standard deviation change in the values of the covariate from their respective sample averages. *. **. and *** indicate statistical significance at the 10%. 5%. and 1% levels respectively.

Probit Analysis of Targeting		
Dependent Variable: Dummy (of Being Targeted)	*Coefficient*	*Marg. Prob. in %*
Log market cap	0.01	*0.00*
BTM	-0.09**	*-0.04*
Q	0.02***	*0.01*
ROA	-0.16**	*-0.07*
Leverage	-0.44***	*-0.18*
Dividend yield	-2.85***	*-1.17*
Analysts	0.02	*0.01*
Institutional ownership	0.08	*0.03*
Manipulator	0.18***	*0.09*
IPO	0.28***	*0.17*
Litigation risk	0.02	*0.01*
Foreign	0.54***	*0.43*
Short interest	3.44***	*1.41*
N	148,776	
Pseudo-R2	0.101	
Percent targeted	0.22%	

TABLE 6: Analysis of response dummy and types

This tables provides the probit and ordinary least square regression coefficients of interest for specification including year and short seller fixed effects with clustered standard errors based on short sellers. See Appendix C for variable definitions. *p<0.1; **p<0.05; ***p<0.01. Controls and IMR accounted for in each specification with N=351.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef.	Marg.	Coef.	Coef.	Coef.
	(1)	Prob.	(2)	(3)	(4)
Dependent variable: Any Response					
Securities fraud	0.26*	8.80%	0.09**	0.10**	0.08
New evidence	0.47***	15.37%	0.15*	0.22***	0.19***
CAR[-1,+1]	-2.45***	-76.83%	-0.01	-0.03	0.01
Dependent variable: Denial					
Securities fraud	0.20	6.39%	0.07	0.07*	0.06
New evidence	0.47***	14.53%	0.14**	0.20***	0.17***
CAR[-1,+1]	-2.11***	-62.06%	0.02	-0.01	0.03
Dependent variable: Hostile					
Securities fraud	0.42	3.07%	0.04*	0.03	0.02
New evidence	0.48*	3.46%	0.05*	0.07***	0.09***
CAR[-1,+1]	-1.58**	-10.60%	0.03	0.03	0.03
Dependent variable: Lawsuit					
Securities fraud	0.49*	3.20%	0.05**	0.03*	0.02
New evidence	0.23	1.61%	0.02	0.05**	0.06***
CAR[-1,+1]	-1.12	-7.20%	0.03	0.03	0.04
Dependent variable: Internal investigation					
Securities fraud	-0.15	-0.56%	0.00	0.00	0.00
New evidence	0.13	0.50%	0.01	0.01	0.02
CAR[-1,+1]	-3.50***	-6.04%	-0.03	-0.02	-0.02
Dependent variable: Additional disclosure					
Securities fraud	0.10	1.58%	0.02	0.03	0.04
New evidence	0.08	1.35%	0.02	0.05	0.05
CAR[-1,+1]	-0.90	14.1%	0.04	0.01	0.03

TABLE 7: Analysis of allegations and outcomes

This tables provides the probit and ordinary least square regression specification including year and short seller fixed effects with clustered standard errors based on short sellers. See Appendix C for variable definitions. *p<0.1; **p<0.05; ***p<0.01. Controls and IMR accounted for in each specification with N=351.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef.	Marg. Prob. %	Coef.	Coef.	Coef.
	(1)		(2)	(3)	(4)
Dependent variable: Delisted					
Accounting issues	0.33	*7.94%*	0.09**	0.09*	0.11**
Disclosure issues	0.11	*2.64%*	0.02	-0.01	0.00
Business issues	-0.71**	*-21.99%*	-0.21***	-0.14**	-0.13*
Management issues	-0.22	*-5.63%*	-0.03	-0.03	-0.04
Securities fraud	0.06	*1.39%*	0.02	0.06	0.07
New evidence	-0.31	*-7.88%*	-0.07	0.01	-0.03
Dependent variable: AAER					
Accounting issues	0.29	*1.10%*	0.02	0.01	0.00
Disclosure issues	-0.27	*-1.19%*	-0.03	-0.02	-0.01
Business issues	-0.98**	*-8.84%*	-0.14***	-0.11***	-0.12**
Management issues	0.29	*1.15%*	0.04*	0.03	0.03
Securities fraud	-0.06	*-0.26%*	0.00	0.02	0.01
New evidence	-0.13	*-0.56%*	-0.02	-0.01	0.00
Dependent variable: Acquired					
Accounting issues	-0.10	*-1.98%*	-0.01	0.00	-0.01
Disclosure issues	0.14	*2.67%*	0.03	0.02	0.00
Business issues	-0.41	*-9.41%*	0.03	0.02	0.00
Management issues	0.05	*0.95%*	0.01	-0.02	-0.04
Securities fraud	-0.64**	*-12.81%*	-0.14***	-0.11**	-0.11**
New evidence	-0.13	*-2.52%*	-0.04	-0.01	-0.01
Dependent variable: Shareholder Class Action					
Accounting issues	-0.02	*0.00%*	-0.01	-0.02	0.02
Disclosure issues	-0.20	*-6.00%*	-0.05	-0.03	-0.01
Business issues	0.16	*4.00%*	0.05	0.04	0.06
Management issues	0.12	*3.00%*	0.05	0.05	0.05
Securities fraud	0.26	*7.00%*	0.07	0.07	0.06
New evidence	0.00	*0.00%*	0.00	0.00	0.03

Continued.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef.	Marg.	Coef.	Coef.	Coef.
	(1)	Prob.	(2)	(3)	(4)
Dependent variable: Restatements					
Accounting issues	-0.10	*-2.00%*	-0.03	-0.04	-0.02
Disclosure issues	-0.09	*-2.00%*	-0.02	-0.02	-0.01
Business issues	-0.60**	*-16.00%*	-0.16**	-0.15*	-0.12
Management issues	0.41*	*8.00%*	0.08	0.07	0.07
Securities fraud	-0.10	*-2.00%*	-0.02	0.00	0.00
New evidence	0.05	*1.00%*	0.01	0.00	0.01
Dependent variable: Director and Officer Change					
Accounting issues	0.01	*0.00%*	0.01	-0.02	-0.02
Disclosure issues	0.20	*8.00%*	0.07	0.10	0.10
Business issues	0.03	*1.00%*	0.01	0.02	0.00
Management issues	0.04	*1.00%*	0.01	0.01	0.01
Securities fraud	0.02	*1.00%*	0.01	0.01	0.04
New evidence	-0.14	*-0.05*	-0.05	-0.12	-0.09
Dependent variable: Auditor Change					
Accounting issues	0.29	*0.00%*	0.02	0.01	0.01
Disclosure issues	0.03	*0.00%*	-0.01	-0.01	0.00
Business issues	0.20	*0.00%*	-0.01	0.02	0.04
Management issues	-0.05	*0.00%*	-0.01	0.01	0.02
Securities fraud	-0.25	*0.00%*	0.00	0.00	0.00
New evidence	-0.07	*0.00%*	0.00	0.02	0.04*

TABLE 8: Firm response types and outcomes

This tables provides the probit and ordinary least square specification including year and short seller fixed effects with clustered standard errors based on short sellers. See Appendix C for variable definitions. *p<0.1; **p<0.05; ***p<0.01. Controls and IMR accounted for in each specification with N=351.

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef.	Marg.	Coef.	Coef.	Coef.
	(1)	Prob.	(2)	(3)	(4)
Dependent variable: Delisted					
No response	-0.60	*-15.40%*	-0.12	-0.09	-0.07
Denial	0.16	*6.00%*	0.04	0.03	0.02
Hostile	-5.11	*-26.60%*	-0.32***	-0.29**	-0.31**
Lawsuit	5.58	*89.70%*	0.46***	0.34***	0.28**
Internal investigation	0.62	*18.10%*	0.16**	0.15**	0.13**
Additional disclosures	0.35	*9.70%*	0.07	0.04	0.03
Dependent variable: AAER					
No response	0.35	*0.50%*	0.13	0.11	0.15
Denial	-0.90	*-0.90%*	-0.16	-0.11	-0.12
Hostile	-3.66	*-1.00%*	-0.02	-0.01	-0.06
Lawsuit	-4.68	*-1.10%*	-0.08	-0.11	-0.11
Internal investigation	1.39**	*8.70%*	0.22***	0.22**	0.19**
Additional disclosures	-0.54	*-0.50%*	-0.06	-0.06	-0.07
Dependent variable: Acquired					
No response	0.31	*6.20%*	0.06	0.08	0.09
Denial	0.23	*5.50%*	0.08	0.02	0.01
Hostile	0.28	*2.60%*	0.02	0.05	0.05
Lawsuit	-0.90	*-10.10%*	-0.16	-0.09	-0.08
Internal investigation	-0.90	*-10.90%*	-0.21**	-0.21***	-0.24***
Additional disclosures	-0.03	*-1.50%*	-0.01	-0.03	-0.02
Dependent variable: Shareholder Class Action					
No response	-0.3	*-7.20%*	-0.06	-0.06	-0.02
Denial	0.0	*-0.10%*	0.00	0.03	0.00
Hostile	1.09*	*39.20%*	0.30	0.29	0.28
Lawsuit	-0.8	*-15.40%*	-0.18	-0.16	-0.21
Internal investigation	0.4	*13.20%*	0.13	0.11	0.04
Additional disclosures	-0.2	*-5.00%*	-0.06	-0.07	-0.05

Continued…

	Probit		OLS		
			No Fixed Effects	Year F.E.	Year and Activist F.E.
	Coef.	Marg. Prob. in %	Coef.	Coef.	Coef.
	(1)		(2)	(3)	(4)
Dependent variable: Restatements					
No response	0.07	*1.40%*	0.04	0.04	0.04
Denial	-0.60	*-10.60%*	-0.12	-0.10	-0.07
Hostile	1.50**	*49.70%*	0.30*	0.28*	0.26
Lawsuit	-2.03**	*-15.00%*	-0.36***	-0.38**	-0.50***
Internal investigation	0.774*	*22.40%*	0.16*	0.15	0.13
Additional disclosures	0.20	*4.40%*	0.02	0.01	0.00
Dependent variable: Director and Officer Change					
No response	-0.36	*-14.10%*	-0.14	-0.17	-0.13
Denial	0.33	*13.00%*	0.13	0.24	0.26
Hostile	0.03	*1.10%*	-0.01	-0.15	-0.06
Lawsuit	-0.34	*-13.30%*	-0.11	0.01	-0.08
Internal investigation	-0.05	*-2.00%*	-0.03	-0.09	-0.18
Additional disclosures	-0.09	*-3.60%*	-0.05	-0.10	-0.06
Dependent variable: Auditor Change					
No response	0.03	*0.00%*	0.00	-0.03	-0.04
Denial	0.11	*0.20%*	-0.01	0.06	0.08
Hostile	-0.19	*0.20%*	0.01	-0.03	-0.02
Lawsuit	-1.04	*0.50%*	-0.09	-0.08	-0.13
Internal investigation	0.73	*2.40%*	0.11	0.07	0.06
Additional disclosures	-0.46	*0.40%*	-0.04	-0.06	-0.08

Appendix A: Short-seller Allegations Taxonomy

Coding example of a short-seller report

Short-seller report by Muddy Waters, LLC on Orient Paper Inc. (NYSE : ONP), report date June 28, 2010
Available at: https://www.muddywatersresearch.com/research/orient-paper-inc/initiating-coverage-onp/ *(accessed 25.10.2018)*

#	**Item**	**Description**	**Example**	**Coding value (0/1)**
1	Accounting issues			
1.a	Revenues	*Overstating revenues*	• ONP overstated 2008 revenue by 27x. • ONP overstated 2009 revenue by approximately 40x.	1
1.b	Expenses	*Understating expenses*		0
1.c	Income	*Overstating income, such as operating or net income*		0
1.d	Cash flows	*Misclassifying or overstating cash flows*		0
1.e	Assets	*Overestimation of assets, improper asset recognition, failure to write down the asset, goodwill overestimated*	• ONP overvalues its assets by at least 10x. Despite inflating the value of its inventory by at least several times, ONP's inventory turns are far fewer than it reports. Once armed with knowledge of the poor state of ONP's production equipment and	1
1.f	Liabilities	*Undisclosed liabilities (e.g. off-balance sheet liabilities) or liabilities not accounted for*		0
1.g	Inadequate Non-GAAP measures	*Inadequate Non-GAAP measures (e.g., EBITDA, EBIT, adj. EBITDA, adj. EBIT)*		0
1.h	Auditor & internal controls	*Weak auditor, frequent changes of auditors and internal control issues*	**Our Theory as to Why ONP's Auditors Have Missed the Fraud** We'd be remiss if we didn't address the question of how the auditors could have missed such a large fraud. For one, ONP's 2007 financials were not audited, although they appear to be if one reads the 2007 Form 10-K. After ONP filed the 2007 Form 10-K, the auditor for the shell company into which HBOP "merged" (see *ONP Has a History of Deceiving Shareholders*) clarified that the unqualified opinion in the 2007 Form 10-K *incorrectly* states that it audited HBOP.[45] It is possible that the work of ONP's subsequent auditors has been affected by this error in the unqualified opinion shown in the 2007 10-K.	1
2	Disclosure issues			

2.a	Incomplete disclosures	*Vague or inadequate disclosures*	received is below. Keep in mind that ONP's equipment values were supposed to be as of 2003. (Moreover because we believe that the equipment dates from the mid-1990s at the newest, it was likely well used at the time of contribution. However, the verification report did not specify whether the equipment was new or used.) In contrast, we received quotes on brand new equipment at 2010 prices.	1
2.b	Serious errors in disclosures	*Disclosures that are inconsistent with the law; fraudulent disclosures, missing documents that are demanded by law/regulation*	ONP overstated its 2008 revenue by approximately 27 times. Put another way, ONP's actual revenue of $2.4 million was only 3.7% of the amount it reported in its Form 10-K.[15]	1
3	Product or business issues			
3.a	Product issues	*Bad products, fake products*	The videos and pictures show that ONP's pitch that "Orient Paper will focus on middle and high-end products and brands, stick with 'excellent technology, superior quality and diversified products'"[33] is untrue. ONP's machinery is obviously poor and incapable of producing high quality paper. Most telling though is ONP's indifference to water and steam in the workshops. Once paper is exposed to water, it is	1
3.b	Business issues	*For instance: Ponzi scheme, inherent unprofitability, related party transactions, missing clients and contracts, production facilities non-existing*	ONP's actual revenue grew little – if at all – from $2.4 million. Our January 5, 2010 site visit showed that ONP is operating at roughly the same scale as it was in 2008. It exhibited almost no truck traffic or logistics activity. We saw no sign that ONP's claimed 600 workers exist. Given that ONP claimed ONP claims to have 600 workers.[21] In reality, it either has a one million dollar contingent labor liability, or it does not have nearly the number of workers it claims. We think the latter is the case. During our site visit, we did not see nearly the level of activity that would imply ONP employs 600 workers. The	1
3.c	Acquisitions and divestitures issues	*Poor or improper acquisition and divestitures*		0
4	Management issues	*Past fraud participation, frequent changes of top management (CEO, CFO)*	to enforce such agreements against himself. We feel that this conflict of interest is difficult for Chairman Liu to manage. However, we have found evidence that the PRC financial statements overstate (likely by at least $20 million or two times) the value of ONP's assets. ONP was a tiny company with equity capital of only $512,000 (RMB 3.5 million) until 2003.[30] In 2003, Chairman Liu and his brother, Xiaodong Liu, invested $10.5 million (RMB 71.5 million) in equity capital.[31] The problem is that none of the investment was in the form of cash. Rather, it was in the form of equipment, the values of which value were established by an "independent" appraiser. (In 2009, ONP apparently found an "independent" appraiser that greatly overvalued the Shuang Xing assets by about 40x or $14.5 million – see *Approximately $30 Million Has Been Misappropriated Since October 2009.*)	1
5	Fraud claim			
5.a	Securities fraud	*If short-seller alleges material lie or omission in connection with the purchase or sale of a security, insider trading* *Filings that included false reports (annual report, quarterly reports). Do they use the word "fraud"?*	**We are confident than ONP is a fraud. Its purpose is to raise and misappropriate tens of millions of dollars.**	1
6	New evidence	*If short-seller provides new information not in existing securities filings, or produces*	ONP overstates the values of its assets by at least 10 times. ONP's 2008 audited PRC balance sheet shows total net assets worth less than half of what it claimed in its 2008 Form 10-K. Our further due diligence, which included contacting suppliers of comparable assets, indicates that ONP's PRC financial statements further overstate its fixed asset values by approximately five times. Thus the total This report includes photographs of ONP's production equipment and inventory.	1

		sufficiently novel analysis of filings to present strong evidence of the alleged improper activity (e.g. photos, legal documents, new analysis and interpretations)		

Appendix B: Target Firm Response Taxonomy

Coding example of a target firm's response

Target company's response via press release 30th July 2010 (Source: Factiva) –
Orient Paper Inc. (ONP) vs. Muddy Waters, LLC

theflyonthewall

Orient Paper denies allegations made by Muddy Waters, LLC

183 Wörter
30 Juni 2010
Theflyonthewall.com
FLYWAL
Englisch

Orient Paper announced its response to allegations made via a report issued by Muddy Waters, LLC on June 28. Muddy Waters claims that as of the date of the report it had a short position in Orient Paper's stock. Muddy Waters claims in the report that as a result of its short position on the day the report was issued it stands to realize significant gains in the event that the price of Orient Paper's stock declines. Additionally, Muddy Waters states in the report that they make no representation as to the accuracy, timeliness or completeness of the information they provided.

The report issued by Muddy Waters contains many inaccuracies, omissions, fabrications, and unsubstantiated claims with a purpose of having the reader draw a conclusion that "ONP is a fraud" whose "purpose is to raise and misappropriate tens of millions of dollars." Orient Paper categorically denies these allegations and has instructed its legal counsel to contact Muddy Waters and explore all legal options against it for publishing and distributing such a report.

Dokument FLYWAL0020100630e66u0050m

Indicator Variable	Explanation Example	Indicator Value
Hostile	*Target company's management provides a hostile answer.*	1
Constructive	*Target company's management provides a constructive answer.*	0
Lawsuit	*Target company's management announces a lawsuit or threatens to sue the short seller.*	1
Internal investigations	*Target company's management announces to conduct internal investigations.*	0
Additional disclosures	*Target company's management provides additional disclosures in response to the short-seller's allegations.*	0
Conference call	*Target company's management also holds a conference call in response to the short-seller's allegations.*	0
Press release	*Target company's management issues a press article in response to the short-seller's allegations.*	1
8-K	*Target company's management files a 8-K in response to the short-seller's allegations.*	0

Appendix C: Variable Definitions

Accounting issues	
Revenue	*Indicator variable of value 1 if the target company overstates its revenues, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Expense	*Indicator variable of value 1 if the target company understates its expenses, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Income	*Indicator variable of value 1 if the target company overstates its income (e.g., operating income, net income), and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Cash flow	*Indicator variable of value 1 if the target company overstates or misclassifies its cash flow, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Assets	*Indicator variable of value 1 if the target company overestimates its assets, and 0 otherwise; or if it conducted improper asset recognition, failure to write down the asset or overestimated goodwill. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Liabilities	*Indicator variable of value 1 if the target company underestimates its liabilities (e.g. off-balance sheet liabilities), and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Non-GAAP	*Indicator variable of value 1 if the target company inadequately uses/discloses Non-GAAP measures (e.g., EBITDA, EBIT, adj. EBITDA, adj. EBIT), and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Audit and internal controls	*Indicator variable of value 1 if the target has a weak auditor, frequent changes of auditors or other internal control issues, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*

Disclosure issues	
Incomplete disclosure	*Indicator variable of value 1 if the target company makes vague or inadequate disclosures, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Errors in disclosure	*Indicator variable of value 1 if the target company makes disclosures that are inconsistent with the law, e.g. fraudulent disclosures, missing documents that are demanded by law/regulation, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*

Product or business issues	
Product	*Indicator variable of value 1 if the target company has bad/fake products, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Business	*Indicator variable of value 1 if the target company has a flawed business model, e.g., inherent unprofitability due to competitive market, related party transactions, missing clients and contracts, production facilities non-existing, and 0 otherwise. See Taxonomy of coding the short-seller reports for more detail in Appendix A.*

Acquisitions and divestitures	*Indicator variable of value 1 if the target company has made poor or improper acquisitions and divestitures, and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*
Management	*Indicator variable of value 1 if the target company has issues with the management, incl. past fraud participation, frequent changes of top management (CEO, CFO), and 0 otherwise. See Taxonomy of coding the short-seller reports for more detail in Appendix A.*
Securities fraud	*Indicator variable of value 1 if the short-seller alleges material lie or omission in connection with the purchase or sale of a security, insider trading. Filings that included false reports (annual report, quarterly reports), and 0 otherwise. Do they use the word "fraud"? See Taxonomy of coding the short-seller reports for more details in Appendix A.*
New evidence	*Indicator variable of value 1 if the short-seller provides new information not in existing securities filings, or produces sufficiently novel analysis of filings to present strong evidence of the alleged improper activity (e.g. photos, legal documents, new analysis and interpretations), and 0 otherwise. See Taxonomy of coding the short-seller reports for more details in Appendix A.*

Response variables	
Press release	*Indicator variable of value 1 if the target company issues a press release, and 0 otherwise.*
Form 8-K	*Indicator variable of value 1 if the target company issues 8-K filing, and 0 otherwise.*
Conference call	*Indicator variable of value 1 if the target company issues a conference call, and 0 otherwise.*
Denial	*Indicator variable of value 1 if the target company makes a hostile response, incl. insulting the short-seller, and 0 otherwise.*
Hostile	*Indicator variable of value 1 if the target company makes a hostile response, incl. insulting the short-seller.*
Constructive	*Indicator variable of value 1 if the target company makes a constructive response, and 0 otherwise.*
Lawsuit	*Indicator variable of value 1 if the target company makes or threatens to file a lawsuit, and 0 otherwise.*
Internal investigation	*Indicator variable of value 1 if the target company announces to conduct internal investigations, e.g. setting up a special committee, and 0 otherwise*
Additional disclosure	*Indicator variable of value 1 if the target company discloses additional information, and 0 otherwise.*
Buy response	*Indicator variable if there are open market purchases by executives and directors (Thomson Insider) in the two weeks following the activist report disclosure.*
Sell response	*Indicator variable if there are open market sales by executives and directors (Thomson Insider) in the two weeks following the activist report disclosure.*

Outcome variables	
AAER	*Indicator variable of value 1 if the target company has an increase of Accounting and Auditing Enforcement Releases (AAER) after the EVENT_DATE, and 0 otherwise. AAER dataset from the USC Leventhal School of Accounting at the Marshall School of Business (Dechow, Ge, Larson and Sloan, 2011).*

Delisting	*Indicator variable of value 1 if the target company is delisted after the EVENT_DATE, and 0 otherwise. CRSP.*
Acquired	*Indicator variable of value 1 if the target company is acquired after the EVENT_DATE, and 0 otherwise. CRSP.*
CAR[-1,+1]	*Is the cumulative abnormal return (CAR) over the window (-1/+1) surrounding the activist short seller report disclosure. cumulative abnormal returns are calculated using the market model:* $CAR[a,b]_i = \prod_{d=a}^{b}(1 + AR_{id}) - 1$, *where* $CAR[a,b]_i$ *is the cumulative abnormal return for firm i for day a through day b.* AR_{id} *is calculated as* $AR_{id} = r_{id} - [\widehat{\alpha_i} + \widehat{\beta_1}RMRF_d + \widehat{\beta_2}SMB_d + \widehat{\beta_3}HML_d + \widehat{\beta_4}UMD_d]$, *where* AR_{id} *is the abnormal return for firm i on day d,* r_{id} *is the excess return of the stock i for day d over the one month Treasury Bill rate,* $RMRF_d$ *is the excess market return for day d using the value weighted CRSP index of all firms traded on the NYSE, NASDAQ, and Amex exchanges,* SMB_d, HML_d, *and* UMD_d *are the portfolio returns on the size, book-to-market, and momentum portfolios on day d, and* $\widehat{\alpha_i}$ *and the* $\widehat{\beta}$*s are estimated from the equation:* $r_{id} = \alpha_i + \beta_1 RMRF_d + \beta_2 SMB_d + \beta_3 HML_d + \beta_4 UMD_d + \varepsilon_{id}$, *using a pre-event period from event day -252 trading days to event day -20 trading days. Observations with less than 70 days of returns data in the estimation period are dropped. CRSP.*
CAR[+2,+60]	*Is the cumulative abnormal return (CAR) over the window (+2/+60). Firms that are delisted during the post-event window CAR calculate up through the delisting date. CRSP.*
CAR[+2,+252]	*Is the cumulative abnormal return (CAR) over the window (+2/+252). Firms that are delisted during the post-event window CAR calculate up through the delisting date. CRSP*
Severe outcome	*Is an indicator if AAER, delisting, bankruptcy or acquired equals 1.*
Shareholder class action	*Indicator variable of value 1 if the target company received a shareholder class action suit filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Securities class action clearinghouse.*
Restatements	*Indicator variable of value 1 if the target company had a restatement filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Audit Analytics.*
Director and officer change	*Indicator variable of value 1 if the target company had a change in top management or a change in directors filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Audit Analytics.*
Auditor change	*Indicator variable of value 1 if the target company had a change of the auditor filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Audit Analytics.*
Abnormal media count	*Use count of media mentions and calculate abnormal media pct in days -65 to -20. Factset, all news sources.*
Daily short interest	*Is the daily percentage of shares outstanding that are shorted. Compustat short_pre/csho/1,000,000*

Control variables	
Log market cap	*Is the log of the market value of equity at the beginning of the fiscal year in which the short-seller report is published (Compustat, csho*prcc_f).*

BTM	*Is the ratio of the target company's book value of equity to its market value of equity as of the beginning of the fiscal year in which the short-seller's report was published. Compustat, Book/MktCap, where Book is defined as seq-pstk and MktCap as csho*prcc_f.*
Leverage	*Is the ratio of long-term debt to the sum of debt and market value of equity. Compustat, calculated via as (long term debt (dltt)+debt in current liabilities(dlc))/total assets(at).*
Analysts	*Is the log number of equity analysts issuing earnings forecasts for the fiscal quarter in which the short-seller's report is published. Compustat and calculated as log(numan + 1).*
Institutional ownership	*Is the percentage of the target company's stock held by institutional investors as of the beginning of the quarter in which the short-seller's report is published. Thomson Insider.*
Foreign	*Indicator variable of value 1 if the target company is foreign headquartered. Compustat loc is not "USA".*
Litigation risk	*Kim and Skinner (2011). Indicator equal to 1 if primary SIC-codes is in the set (2833:2836, 3570:3577, 3600:3647, 5200:5961, 7370:7374, 8731:8734). Compustat*
Short interest	*Is the percentage of shares outstanding that are shorted prior to the short seller's report publication date. Compustat short_pre/csho/1,000,000.*
Q	*Tobin's Q. Compustat ((Long term debt (dltt)+ debt in current liabilities (dlc) + price times shares outstanding (prc*shrout))/(Long term debt (dltt) + debt in current liabilities (dlc)+ (shareholders' equity (seq) – preferred stock (pstk)).*
Dividend yield	*The dividend yield. Compustat (dvp+dvc)/(MktCap+pstk.*
ROA	*Return on Assets. Compustat ibadj/shift(at,1,NA,"lag")?*
Manipulator	*Indicator variable equal to 1 if the M-score is greater than -1.78, and where the M-score is calculated as -4.84 + .920 * dsri + .528 * gmi + .404 * aqi + .892 * sgi + .115 * depi - .172 * sgai + 4.679 * tata - .327 * lvgi (see Beneish 1999 for the calculation of the underlying ratios.) Compustat.*
IPO	*Indicator variable equal to 1 if the report is filed during the first year the company is listed in Compustat.*
Earnings announcement	*Indicator variable of value 1 if the target company's response is within five days of a quarterly earnings announcement date, and 0 otherwise.*
Avg pre-returns	*Cumulative abnormal returns in the (-5/-1) relative to the event date. CRSP.*